This listing of claims will replace all prior versions, listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A bio-fuel cell system for concurrent production of electrical power and single-cell protein, and consumption of carbon dioxide (CO_2), comprising;

a cathode compartment containing a cathode electrode with an aqueous solution containing ferric ions (Fe^{3+}) being circulated into said cathode compartment with a reaction at the cathode electrode being reduction of ferric ions at the cathode electrode in a reaction given by $4Fe^{3+} + 4e^- = 4Fe^{2+}$;

an anode compartment containing an anode electrode~~;~~.

~~a first means for injecting~~ with a fuel having a hydrogen constituent being pumped directly into said anode compartment, said anode compartment being separated from said cathode compartment by a membrane permeable to protons, a reaction at the anode electrode being electrochemical oxidation of at least the hydrogen constituent of the fuel to produce electrons (e^-) and protons (H^+), wherein protons (H+) formed by the oxidation of hydrogen cross the proton exchange membrane into the cathode compartment; and

a bioreactor containing chemolithotrophic microorganisms and dissolved nutrients to facilitate growth of the chemolithotrophic microorganisms, a pump for pumping ~~a second means for injecting~~ a fluid containing oxygen (O_2) and atmospheric carbon dioxide into the bioreactor, the bioreactor being in flow communication with the cathode compartment so that an aqueous solution containing ferrous ions (Fe^{2+}) and protons (H^+) is circulated from the cathode compartment to the bioreactor where the ferrous ions (Fe^{2+}) are oxidized by the chemolithotrophic microorganisms to ferric ions (Fe^{3+}) in an aerobic oxidation reaction given by $4Fe^{2+} + 4H^+ + O_2 = 4Fe^{3+} + 2H_2O$, and wherein single-cell protein production and carbon dioxide consumption responsively occurs due to fixation of the carbon dioxide (CO_2) by the chemolithotrophic microorganisms in the presence of the dissolved nutrient salts and ferrous ions;

~~means for circulating~~ a pump for pumping a fluid containing said ferric ions (Fe^{3+}) into said cathode compartment from said bioreactor; and

wherein electrical power is obtained by making electrical connection between a load and the anode and cathode electrodes.

2. (original) The bio-fuel cell system according to claim 1 wherein the membrane permeable to protons is a proton exchange membrane.

3. (original) The bio-fuel cell system according to claim 1 wherein the membrane permeable to protons is made of a substantially inert material having pores extending therethrough less than about 10 micrometers in diameter.

4. (Cancelled)

5. (Previously presented) The bio-fuel cell system according to claim 1 wherein the dissolved nutrients is one or more of ammonium sulfate, potassium phosphate, magnesium sulfate, potassium chloride, calcium nitrate, calcium chloride and sulfuric acid.

6. (previously presented) The bio-fuel cell system according to claim 1, wherein the fuel having a hydrogen constituent is selected from the group consisting of hydrogen gas, methanol, methane and ethanol.

7. (previously presented) The bio-fuel cell system according to claim 1, wherein the fuel having a hydrogen constituent is hydrogen gas (H_2), and wherein the electrochemical oxidation reaction is oxidation of hydrogen at the anode electrode in a reaction given by $2H_2 = 4H^+ + 4e^-$, and so that an overall bio-fuel cell reaction is given by $2H_2 + O_2 = 2H_2O$.

8. (previously presented) The bio-fuel cell system according to claim 1, wherein the chemolithotrophic microorganisms are *Acidithiobacillus ferroxidans*.

9. (previously presented) The bio-fuel cell system according to claim 1, wherein the chemolithotrophic microorganisms are selected from the group consisting of *Leptospirillum ferrooxidans*, *Acidimicrobium,Alicyclobacillus, and Sulfobacillus.*

10. (previously presented) The bio-fuel cell system according to claim 1, wherein the cathode electrode is made from a chemically inert electrically conducting material.

11. (original) The bio-fuel cell system according to claim 10 wherein the cathode electrode includes a layer of a porous material selected from the group consisting of carbon, nickel and stainless steel.

12. (original) The bio-fuel cell system according to claim 10 wherein the cathode electrode includes a solid plate of a material selected from the group consisting of carbon, nickel and stainless steel.

13. (previously presented) The bio-fuel cell system according to claim 10, wherein the cathode electrode includes a catalyst.

14. (original) The bio-fuel cell system according to claim 13 wherein the catalyst is one of gold, platinum, palladium and lead.

15. (previously presented) The bio-fuel cell system according to claim 1, wherein the bioreactor is a vessel in flow communication with the cathode compartment and enclosing the chemolithotrophic microorganisms, and wherein the aqueous solution containing ferric ions (Fe^{3+}) is circulated into said cathode compartment, including a pump for circulating the aqueous solution containing ferrous ions (Fe^{2+}) and protons (H^{+}) produced in the cathode compartment between the cathode compartment and the bioreactor, where the ferrous ions (Fe^{2+}) are oxidized by the chemolithotrophic microorganisms to ferric ions (Fe^{3+}) in said aerobic oxidation reaction, and wherein the ferric ions are recirculated back to the cathode compartment.

16. (Cancelled)

17. (Currently amended) The bio-fuel cell system according to claim ~~16~~ 1 including means for applying and controlling a voltage on the cathode electrode for controlling a ratio of electrical production to single-cell protein production by varying microbial cultivation parameters.

18. (Currently amended) The bio-fuel cell system according to claim ~~16~~ 1 including means for controlling a ratio of Fe^{2+}/Fe^{3+} concentrations for varying microbial cultivation parameters in order to control a ratio of electrical production to single-cell protein production.

19. (Previously presented) The bio-fuel cell system according to claim 4 including means for controlling concentrations of the dissolved nutrients concentrations for varying microbial cultivation parameters in order to control a ratio of electrical production to single-cell protein production.